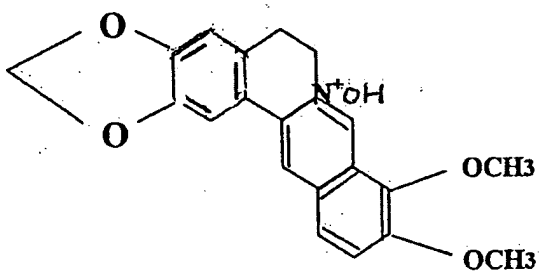

FIG. 1A

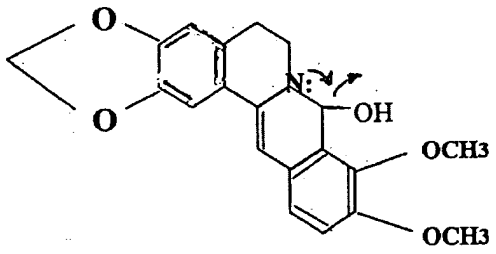

FIG. 1B

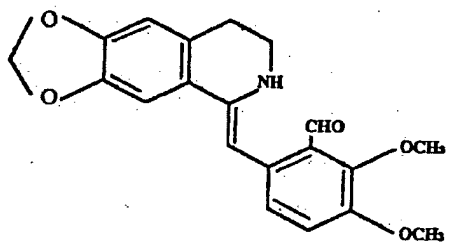

FIG. 1C

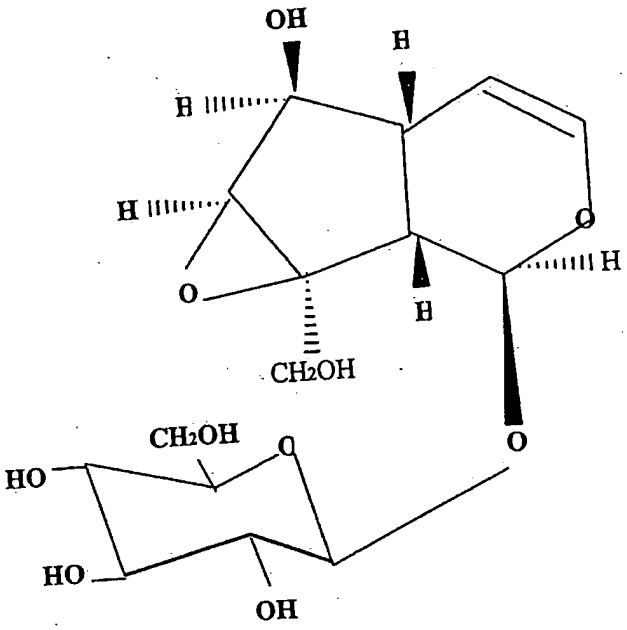
OH
H
H
H
O
H
O
H
CH2OH
CH2OH
O
O
HO
HO
OH

FIG. 2

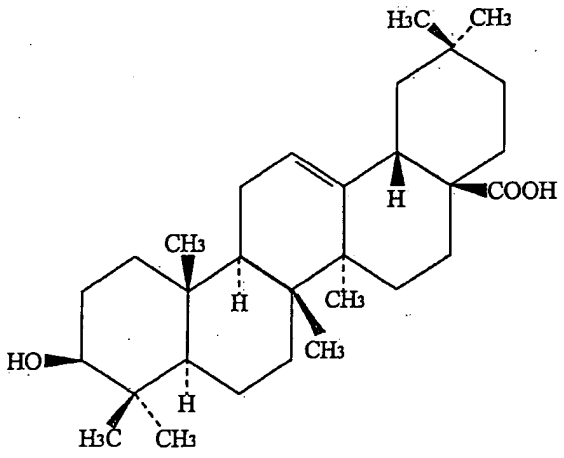
H3C
CH3
H
COOH
CH3
H
CH3
CH3
HO
H
H3C
CH3

FIG. 3

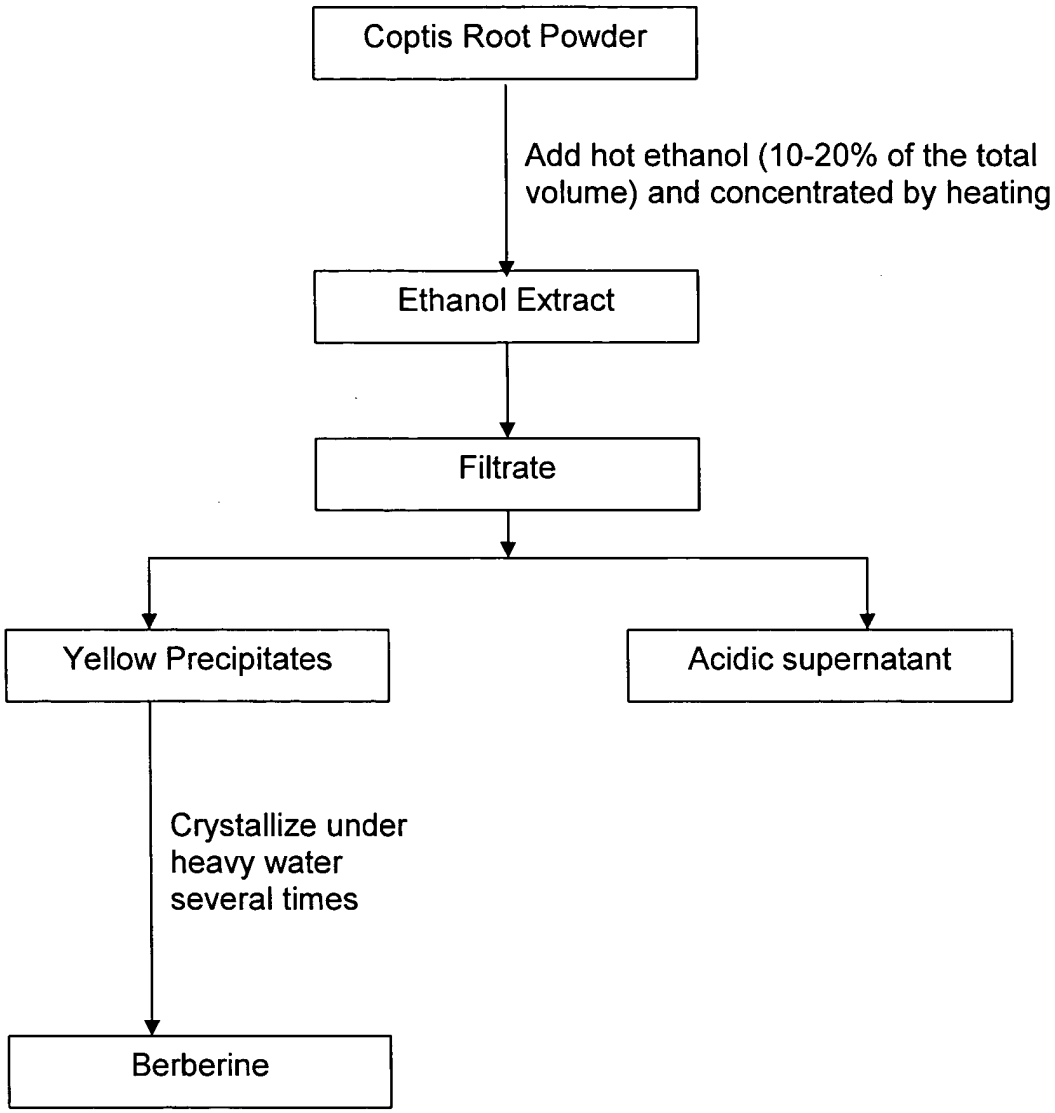
Coptis Root Powder
Add hot ethanol (10-20% of the total volume) and concentrated by heating
Ethanol Extract
Filtrate
Yellow Precipitates
Acidic supernatant
Crystallize under heavy water several times
Berberine

FIG. 4

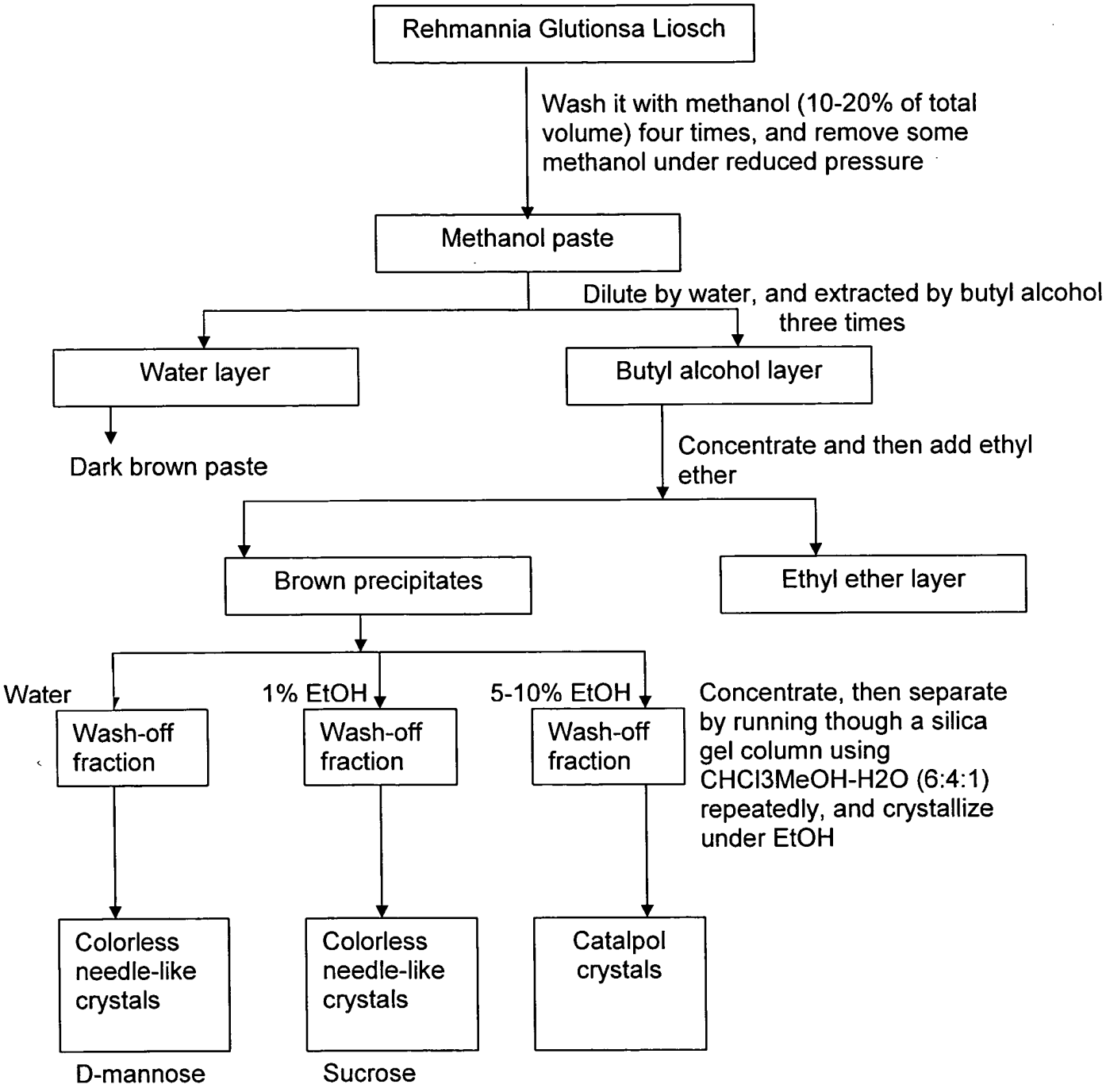
Rehmannia Glutionsa Liosch
Wash it with methanol (10-20% of total volume) four times, and remove some methanol under reduced pressure
Methanol paste
Dilute by water, and extracted by butyl alcohol three times
Water layer
Butyl alcohol layer
Dark brown paste
Concentrate and then add ethyl ether
Brown precipitates
Ethyl ether layer
Water
1% EtOH
5-10% EtOH
Wash-off fraction
Wash-off fraction
Wash-off fraction
Concentrate, then separate by running though a silica gel column using CHCl3MeOH-H2O (6:4:1) repeatedly, and crystallize under EtOH
Colorless needle-like crystals
Colorless needle-like crystals
Catalpol crystals
D-mannose
Sucrose

FIG. 5

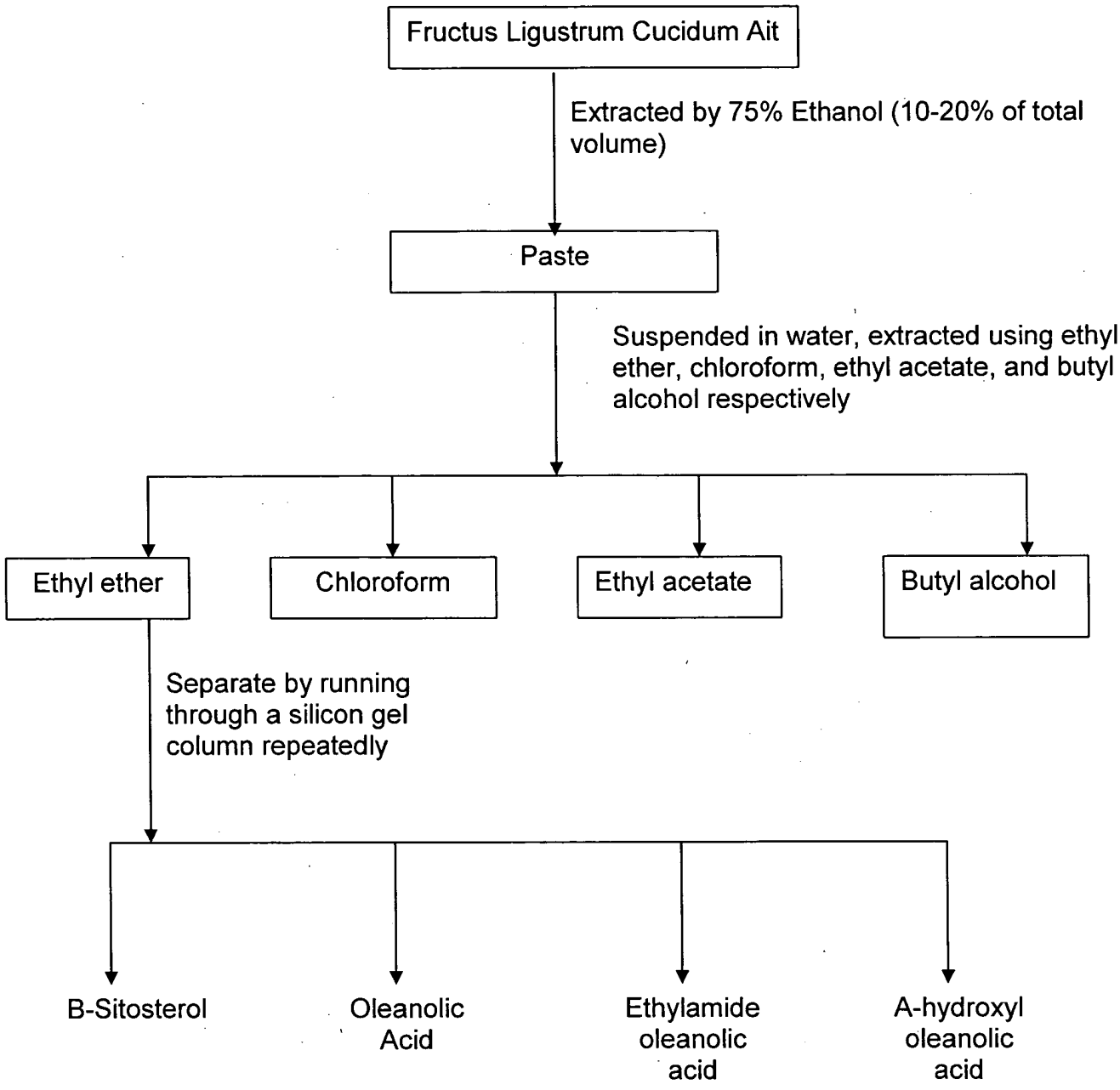
Fructus Ligustrum Cucidum Ait
Extracted by 75% Ethanol (10-20% of total volume)
Paste
Suspended in water, extracted using ethyl ether, chloroform, ethyl acetate, and butyl alcohol respectively
Ethyl ether
Chloroform
Ethyl acetate
Butyl alcohol
Separate by running through a silicon gel column repeatedly
B-Sitosterol
Oleanolic Acid
Ethylamide oleanolic acid
A-hydroxyl oleanolic acid

FIG. 6

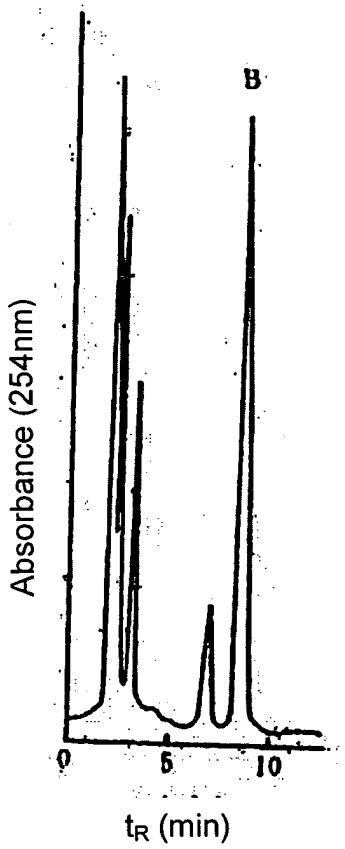

FIG. 7

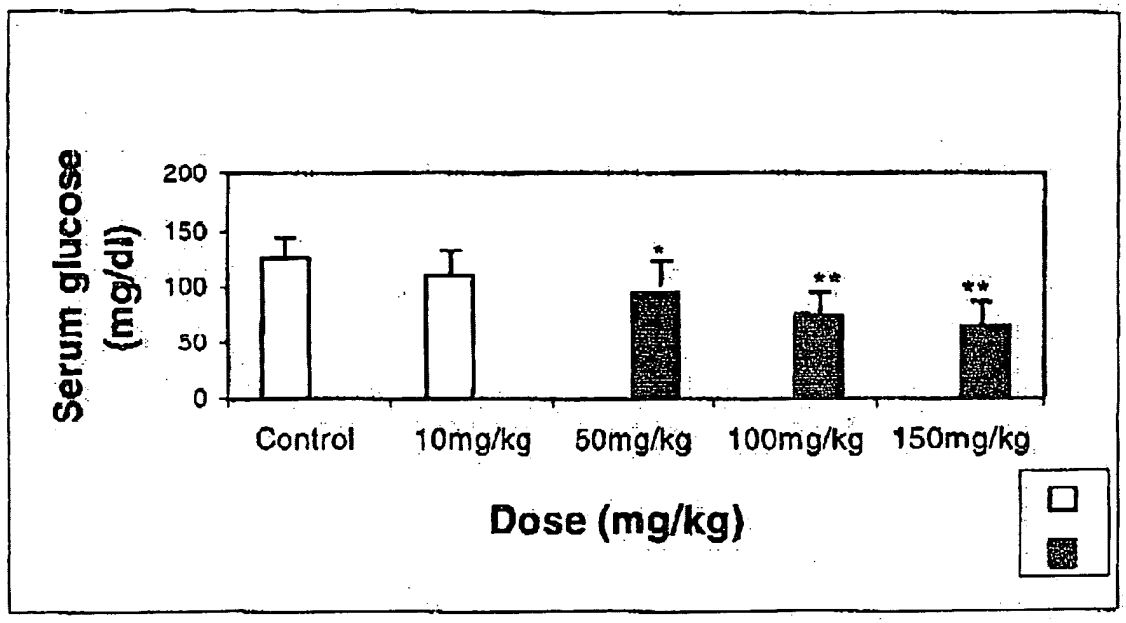
Serum glucose (mg/dl)
200
150
100
50
0
Control
10mg/kg
50mg/kg
100mg/kg
150mg/kg
Dose (mg/kg)

FIG. 8

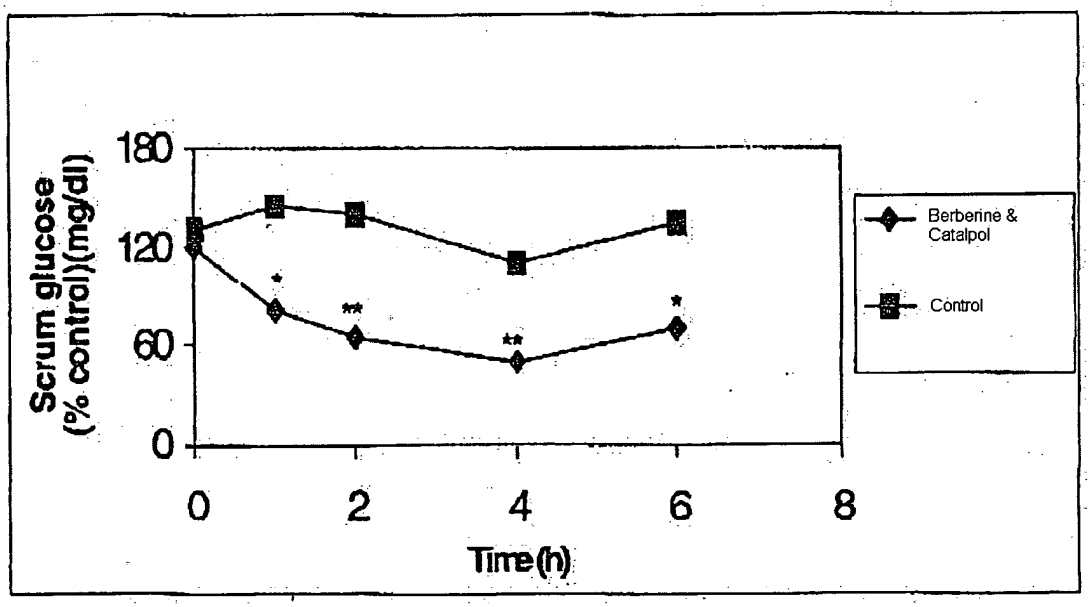
Serum glucose (% control)(mg/dl)
180
120
60
0
0
2
4
6
8
Time(h)
Berberine & Catalpol
Control

FIG. 9

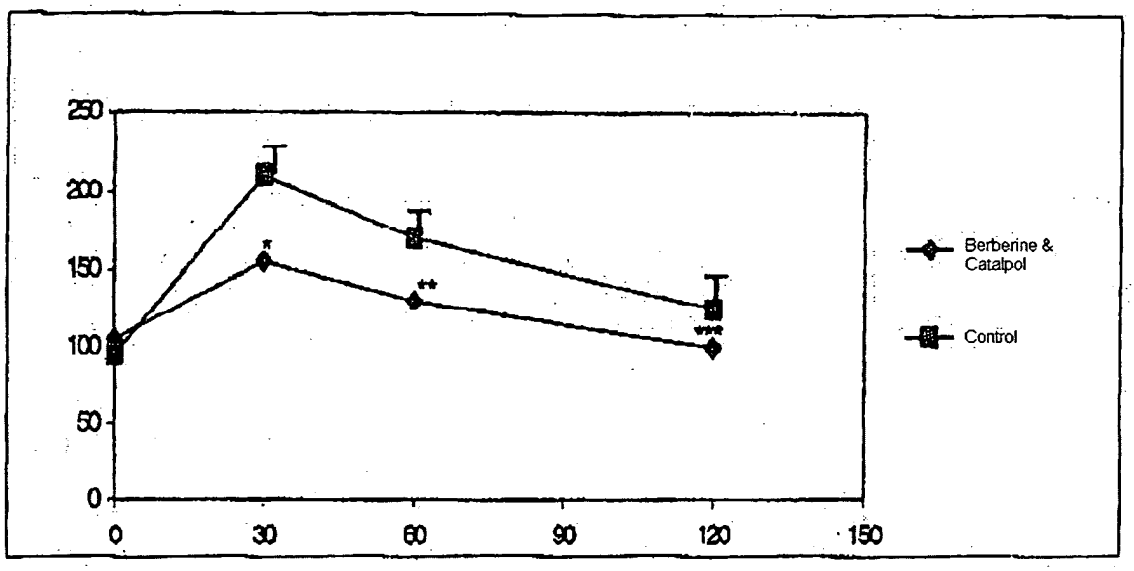
250
200
150
100
50
0
0
30
60
90
120
150
*
**
***
Berberine & Catalpol
Control

FIG. 10

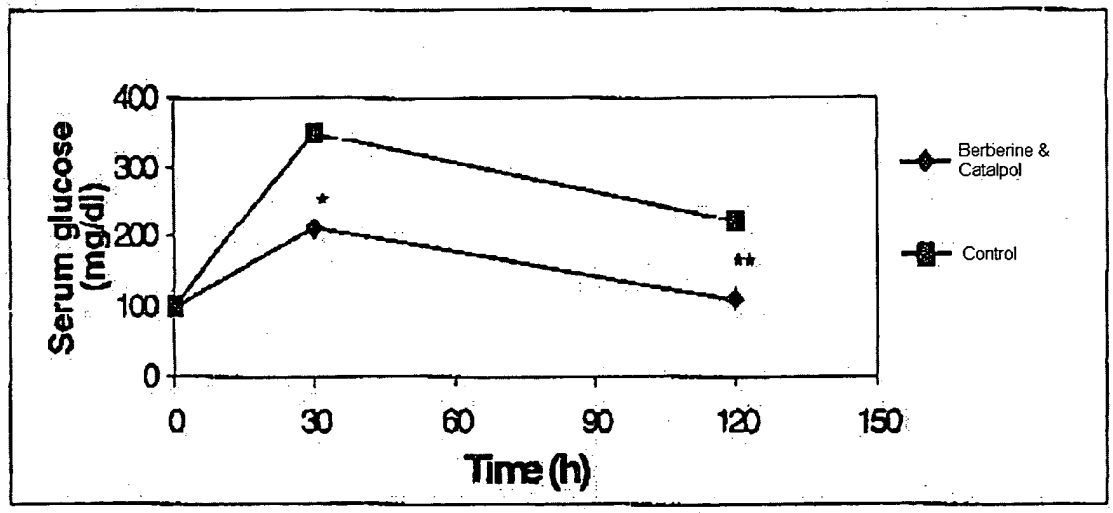
Serum glucose (mg/dl)
400
300
200
100
0
0
30
60
90
120
150
Time (h)
*
**
Berberine & Catalpol
Control

FIG. 11

Table 1: Effects of Berberine and Catalpol on Plasma sugar levels of Mice

	Plasma Glucose Level after Injections				
Days	7	14	21	28	38
Berberine/catalpol (n=20)	90.21*	94.38*	82.47*	90.34*	97.21*
Control (n=12)	185.96	189.21	182.33	188.45	195.28

* $p<0.01$

FIG. 12

Table 2: The effects of berberine and catalpol on Insulin beta Cell Count

	The count of various grade groups					
Group	Ineffective	Improved	Clearly Effective	Controlled	Total	Average
Control (n=12)	9	3	0	0	33	2.75
Berberine and catalpol (n=20)	0	2	5	13	15.5	0.775**

$P<0.01$

FIG. 13

Table 4: The effects of berberine and catalpol (50mg/kg/dl) on plasma glucose level of normal mice (X±SD)

	Plasma Glucose (mg/dl)	
	Control (no drug)	Berberine and catalpol administration
One time administration	130.8 ± 22.6 (n=10)	72.4±31.1 (n=10)*
Seven day administration	135.6 ± 36.3 (n=9)	74.6±22.3 (n=9)*

*p<0.01

FIG. 14

Table 5: Effects of berberine and catalpol on plasma glucose level elevation caused by adrenaline (10 mice in each group X ± SD)

Group	Dose (mg/kg)	Plasma glucose (mg/dl)
Saline only	Not applicable	167.4±18.5
Adrenaline only	0.02 iP	225.1±51.2
Adrenaline and berberine and catalpol	002, iP & 50, PO	172.6 ± 26.8*

*p<0.02

FIG. 15

Table 6: Effect of berberine and catalpol (50 mg/kg/dl) on the plasma glucose level of the tetraoxide alloxan diabetic mice

	Plasma glucose level (mg/dl)	
Day	Control	Berberine and catalpol
1	295.3±72.2	153.2±81.2*
5	531.8±84.5	320.2±96.3**
10	478.2±61.4	150.6±56.5***

*p<0.01

**p<0.02

***p<0.001

FIG. 16

Table 7: Effect of berberine and catalpol on platelet aggregation of rabbits in vitro (X ±+ SD, n=6)

Dose (ug/ml)	Aggregation (%)	Inhibited Aggregation (%)
0	43.2±2.1	Not Applicable
40	36.1±6.2	20.1±13.5
80	32.6±5.6*	26.3±12.8
100	20.1±4.2**	51.2±10.2
160	15.2±5.2**	66.4±12.8
200	7.6±3.6***	85.6±9.6

*p<0.05

**p<0.01

***p<0.001

FIG. 17

Table 8: Changes of plasma sugar, cholesterol, lipoprotein and apolipoprotein of the participated groups

Items	Treatment (n=60)	Control (n=40)	Normal (n=40)
FPG (mmol/l)			
Before treatment	13.4±3.67	12.98±3.10	8.95±2.33
After treatment	6.10±2.10**	8.90±2.70	8.77±3.21
TC (mmol/l)			
Before treatment	5.99±0.73	5.71±0.64	5.61±0.27
After treatment	4.23±0.51**	5.62±0.35	5.59±0.42
TG (mmol/l)			
Before treatment	2.67±0.38	2.25±0.31	2.27±0.48
After treatment	1.02±0.31**	2.24±0.47	1.57±0.33
HDL-C (mmol/l)			
Before treatment	1.01±0.10	1.18±0.25	1.12±0.20
After treatment	2.10±0.22**	1.24±0.16	1.98±0.18
LDL-C (mmol/l)			
Before treatment	4.90±0.37	4.10±0.27	4.02±0.16
After treatment	3.02±0.28**	4.03±0.38	3.43±0.20
APO A1 (g/l)			
Before treatment	1.01+0.21	1.02±0.07	1.05±0.11
After treatment	1.32+0.12*	1.05±0.05	1.29±0.21*
APO B (g/l)			
Before treatment	1.02+0.25	1.08±0.36	0.99±0.24
After treatment	0.69+0.18*	1.01±0.27	0.67±0.36*

*$p<0.05$

**$p<0.01$

FIG. 18

Table 9: Hematological properties of the treatment group and control group before and after treatment (X ± SD)

Items examined	Treatment group (n=60)	Control group (n=40)
Whole blood viscosity (mPa-S)		
Before treatment	6.98±0.91	6.95±1.26
After treatment	4.10±0.69	6.68±1.10
Blood plasma viscosity (mPa-S)		
Before treatment	1.94±0.42	1.93±0.55
After treatment	1.37±0.35	1.89±0.35
Fibrinogen (g/l)		
Before treatment	4.20±1.07	4.19±1.31
After treatment	3.16±1.05	4.11±1.18
Hematocrit (%)		
Before treatment	49.28±7.25	49.20±7.39
After treatment	40.26±4.67	47.02±6.28

FIG. 19